IN THE CLAIMS:

1. **(Currently Amended)** An auditory screening device, comprising:

a portable hand-held enclosure;

a signal processor housed by said enclosure, said processor having a computer program operated on command by a user, said program producing one or more auditory tests and associated stimulus signals selected from a group comprising otoacoustic auditory emission ~~(OAE)~~ test procedures, auditory brainstem response ~~(ABR)~~ test procedures, tympanometry, and otoreflectance ~~and combinations thereof~~ for a test subject;

a memory module housed by said hand-held enclosure, said memory module operatively connected to said signal processor and configured to maintain at least one test subject record;

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a display device mounted to said enclosure, said display device being operatively connected to said signal processor, said display device displaying the results of the selected test in real time;

a probe connection point on said enclosure ~~for a probe~~, the probe connection point being operatively connected to said signal processor; and

a power supply for operating the signal processor.

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2. **(Original)** The screening device of claim 1 further including a plurality of electrodes for collecting data from a patient, said electrodes being operatively connected to said signal processor.

3. **(Currently Amended)**The device of claim [[2]] 1 further including a tympanometry interface operatively connected to said signal processor for recording

middle ear pressure on a test subject and adjusting minor middle ear conditions during [[OAE]] otoacoustic auditory emission and [[ABR]] auditory brainstem response testing.

4. (Currently Amended) The device of claim [[3]] 1 further including an otoreflectance interface operatively connected to said signal processor for recording or assessing middle ear conditions on a test subject.

5. (Currently Amended) The device of claim [[4]] 1 further including an ~~OAE~~ otoacoustic auditory emission simulator interface operatively connected to said signal processor for testing the integrity of an ~~OAE~~ otoacoustic auditory emission system.

6. (Currently Amended) The device of claim [[5]] 1 further including an infrared interface operatively connected to said signal processor for permitting communication between said signal processor and an external device.

7. (Cancelled)

A | **8. (Currently Amended)** The device of claim [[7]] 1 further including a memory mapped input/output device operatively connected to said memory subsystem and to said signal processor, said display being operatively connected to said signal processor through said memory mapped device.

9. (Original) The device of claim 8 further including a keyboard, said keyboard being operatively connected to said signal processor through said memory mapped device.

10. (Currently Amended) The device of claim [[9]] 1 wherein said power supply is rechargeable.

11. (Currently Amended) The device of claim 1 wherein said signal processor ~~performs~~ is configured to perform a time domain sum and average over time

for obtaining ~~OAE~~ otoacoustic auditory emission signal detection using a offset frame overlap method.

12. (Currently Amended) ~~The device of claim 11~~ An auditory screening device, comprising:

a portable hand-held enclosure;

a signal processor housed by said enclosure, said signal processor having a computer program operated on command by a user, said program configured to produce auditory tests selected from a group comprising otoacoustic emission test procedures, auditory brainstem response test procedures, tympanometry, otoreflectance, and combinations thereof for a test subject;

a display device mounted to said enclosure, said display device being operatively connected to said signal processor, said display device displaying the results of the selected test in real time;

a connection point on said enclosure for a probe, the connection point being operatively connected to said signal processor; and

a power supply for operating the signal processor;

wherein said signal processor is configured to perform a time domain sum and average over time for otoacoustic emission test signal detection, using a frame overlap method; and

wherein ~~said~~ a memory subsystem includes provisions for patient data.

13. (Currently Amended) The device of claim 12 wherein ~~the ABR~~ an auditory brainstem test signal is determined by digital signal processing and counting zero crossings of correlated internally generated sinusoids.

14. (Currently Amended) A method of conducting an [[OAE]] otoacoustic auditory emission audio test, comprising the steps of:

inserting a probe in a patient's ear, ~~the~~ said probe including a speaker and a microphone;

connecting ~~the~~ said probe to a hand-held device;

generating an auditory signal in ~~the~~ said hand-held device;

detecting incoming auditory signals generated in ~~the~~ said ear via ~~the~~ said microphone;

converting ~~the~~ said incoming auditory ~~analog~~ signals to digital ~~signals~~ signal data;

storing ~~the~~ said incoming digital signal data in a new frame buffer;

sizing ~~the~~ said new frame buffer ~~so that it is~~ to be an integer number of samples of two primary tones ~~and~~ at frequencies f_1 and f_2 and ~~also~~ an integer number of samples of ~~the~~ a tone produced by ~~the~~ said ear ~~defined by the~~ at frequency f_{dp};

passing ~~the~~ digital signal data from a single frame to a discrete Fourier transform process to calculate ~~the~~ a frequency specific magnitude and phase content of ~~the~~ said incoming auditory signal signal;

comparing ~~the~~ said calculated magnitude and phase to a table to ~~detect~~ determine whether to reject the digital signal data, to discard the digital signal data but update a noise table; or to save ~~accept~~ the digital signal data;

~~saving a copy of the frame data;~~

~~sliding the date frame by a predetermined amount;~~

collecting ~~the~~ said digital signal data ~~over~~ until a predetermined number of frames have been saved;

averaging ~~the~~ said digital signal data over a predetermined number of sequential frames, wherein data from sequentially preceding frames is slid by a predetermined number of data points prior to said averaging;

converting ~~the~~ said averaged data to a frequency domain; and

displaying ~~the~~ said averaged frequency domain data to the user in a hand-held device in real time.

15. (Currently Amended) The method of claim 14 further including the step of saving the digital signal data internally ~~of the~~ in said hand-held device.

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16. (Original) The method of claim 15 further including the step of sending to the user an indication of the subject passing or failing the test.

17. (Currently Amended) The method of claim [[16]] 17 further including the step of transferring ~~the~~ said digital signal data from ~~the~~ said hand-held device to ~~a~~ an ~~second~~ external unit.

18. (Currently Amended) An auditory screening device ~~comprising;~~ comprising:

a hand-held enclosure;

a signal processor within said enclosure;

a memory module within said enclosure operatively connected to said signal processor;

a display screen mounted to said enclosure, said display screen being operatively connected to said signal processor;

a computer program at least partial contained in said signal processor, said computer program being accessible by a user to perform an otoacoustic emission test and an auditory brainstem response test for a test subject, said memory module maintaining a plurality of test subject records for display on said display ~~screen;~~ screen.

19. (Original) The screening device of claim 18 further including a keyboard for accessing said computer program.

20. (Amended) The device of claim 19 wherein the [[OAE]] otoacoustic auditory emission information is recorded by frames, and information from a preceding frame is used in connection with information of a succeeding frame to reduce the signal to noise level in the received signals.

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21. (Original) The device of claim 20 wherein the amount of information employed with a succeeding frame is obtained from the formula:

$$M = \left(\frac{f_n}{f_s - 1}\right) \times \left(\frac{f_s}{f_{dcl} + 1}\right)$$

where M equals overlap number, f_n equals frame number, f_s equals frame size and f_{dcl} equals frame data cycle length.

22. (Amended) The device of claim 21 wherein said computer program further includes tympanometry test procedures conducted independently or in conjunction with [[OAE]] otoacoustic auditory emission and [[ABR]] auditory brainstem response tests.

23. (Amended) The device of claim 22 wherein the computer program determines data information for the brainstem response test by counting zero ~~crossing~~ crossings of a sinusoid.

24. (Currently Amended) A method of conducting an ~~OAE otoacoustic~~ auditory test in which a reduced noise ratio is obtained by:

receiving ~~OAE~~ auditory signal information in frames;

averaging data in a current frame with data from at least one previous frame, said data from said at least one previous frame slid by a predetermined number of data points;

~~overlapping information from a proceeding frame for use in connection with information from a succeeding frame;~~

making a determination to accept the averaged data, reject the ~~data, but~~ averaged data and update a noise ~~average~~ average, or to discard the averaged data based upon at least one predefined ~~parameters~~ parameter.

25. (Currently Amended) ~~The method of claims 24~~ A method of conducting an otoacoustic auditory emission test in which reduced noise ratio is obtained by:

receiving otoacoustic auditory emission signal information in frames;

overlapping information from a proceeding frame for use in connection with information from a succeeding frame;

making a determination to accept the data, to reject the data but update a noise average, or to discard the data based upon predefined parameters;

wherein an overlap is determined from the formula:

$$M = \left(\frac{f_n}{f_s - 1}\right) \times \left(\frac{f_s}{f_{dcl} + 1}\right)$$

where M equals overlap number, f_n equals frame number, f_s equals frame size and f_{dcl} equals frame data cycle length.

26. (Original) The method of claim 25 further including the step of conducting an auditory brainstem response ~~(ABR)~~ test for a test subject.

27. (Amended) The method of claim 26 wherein data for the [[ABR]] auditory brainstem response test is obtained by counting zero crossings of an internally generated, correlated sinusoid.

28. (Currently Amended) The ~~An~~ auditory screening device of Claim 1 ~~comprising:~~ wherein

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~~a portable hand-held enclosure;~~

~~a signal processor housed by said enclosure;~~

said signal processor ~~having~~ is further configured with an OAE simulator program at least partially contained in said ~~processor;~~ signal processor, whereby said signal processor ~~generating~~ is configured to generate simulated f_{dp} tones in response to tones generated by a probe ~~an ear probe; and~~

~~an ear probe interface operatively connected to said processor~~.

29. (New) An auditory screening device, comprising:

a portable hand-held enclosure;

a signal processor housed by said enclosure;

at least one input/output interface housed by said enclosure and operatively coupled to said signal processor;

a memory module housed by said enclosure, said memory module operatively connected to said signal processor and configured to maintain at least one test subject record;

wherein said signal processor is configured to transmit and receive signals through said at least one input/output interface to conduct one or more auditory test procedures selected from a group comprising otoacoustic emission test procedures, otoreflectance test procedures, auditory brainstem response test procedures, tympanometry test procedures on a test subject; and

wherein said signal processor is configured to process otoacoustic emission signals received through said input/output interface using an offset frame overlap method to reduce uncorrelated noise present in results associated with said otoacoustic emissions test procedure.

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30. (New) The auditory screening device of Claim 29 further including:

a display screen mounted to said enclosure, said display screen being operatively connected to said signal processor; and

wherein said signal processor is further configured to display results associated with a selected test procedure on said display screen.

31. (New) The auditory screening device of Claim 29 wherein said at least one input/output interface is an otoacoustic emission interface, said otoacoustic emission interface including at least one sound transducer configured to present a

variety of acoustic signals to a test subject ear, and a microphone configured to receive response acoustic signals from said test subject ear.

32. (New) The auditory screening device of Claim 31 wherein said otoacoustic emission interface is further configured for otoreflectance measurements of a test subject middle ear condition.

33. (New) The auditory screening device of Claim 29 wherein said at least one input/output interface is an auditory brainstem interface, said auditory brainstem interface including at least one sound transducer configured to present an auditory stimulus to a test subject ear, and at least one electrode configured to receive response bioelectrical signals from said test subject.

34. (New) The auditory screening device of Claim 29 wherein said at least one input/output interface is a tympanometry interface, said tympanometry interface including at least one electronic control channel, a pump operatively coupled to said electronic control channel for altering a pressure level in a test subject ear, and a pressure sensor configured to measure said pressure level in said test subject ear.

35. (New) The auditory screening device of Claim 29 wherein said signal processor is further configured, for each auditory test procedure, to transmit at least one stimulus signal though said input/output interface.